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DIPLOMARBEIT

Effects of gender and personality on practical performance of human-dog dyads

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1. Zusammenfassung

Meine Diplomarbeit beschäftigt sich mit den Interaktionen zwischen Mensch und Hund in verschiedenen Situationen: während eines Freizeit-Agility-Parcours, sowie einer Speichel- und Blutprobenentnahme. Diese Probennahmen dienten als Testsituation, sowie zur Bestimmung des Stresshormons Kortisol (aus Speichel).
Als Basis diente die Studie von Kotrschal et al. (2009), die dieselben Methoden und statistischen Analysen verwendete, mit dem Unterschied, dass in deren Studie drei Treffen mit Besitzer und Hund notwendig waren und hier die Daten während eines nicht auf Wettbewerb ausgelegten Agility-Turniers im Rahmen des Jahrestreffens 2007 des Eurasier Club Austria gesammelt wurden.
Die Fragestellung lautete, ob es Beziehungen zwischen den Persönlichkeiten, den Interaktionen und der Performance gab, wie es in der Studie von Kotrschal et al. (2009) gezeigt wurde.
Dabei wurde besonders auf die Effekte geachtet, die die Persönlichkeit des Besitzers auf den Hund ausübte und somit die Qualität der Beziehung zwischen den beiden Partnern beeinflusste. Hier spielte auch das Geschlecht des Hundehalters, wie auch vom Hund selber eine wichtige Rolle.
Mit Hilfe der Speichelproben konnten wir auch den Kortisol-Level während des Parcours feststellen mit der Frage, ob sie Geschlechtsunterschiede aufweisen würden.
Außerdem gingen wir davon aus, dass es zwei unterschiedliche Gruppen von Teams gab: einige Teams hatten die Testsituation Parcours besser bewältigt als andere. Die Frage, die wir uns stellten, lautete: Was war der Unterschied? Welches Verhalten bzw. Interaktion war effizienter?
Bei den zur Verfügung stehenden Daten handelte es sich um Fragebögen, Videoaufnahmen, aufgenommen in unterschiedlichen Situationen, sowie Blut- und Speichelproben. Ein allgemeiner Fragebogen, der nach den Grunddaten, d.h. dem Lebensumfeld von Hund und Besitzer, sowie die Einstellung des Halters zu seinem Hund hinterfragt (nach Johannson 1999) sowie NEO, ein standardisierter Fragebogen, der die Persönlichkeit des Halters ermittelt (NEO-FFI entwickelt von Costa und McCrae (1989) und von Borkenau und Ostendorf (1993) ins Deutsche übersetzt), waren vor dem Parcour auszufüllen.
Insgesamt wurden von 63- Hund- Halter- Dyaden an diesem Wochenende Daten gesammelt.

Der Parcours, der von 27 Besitzer- Hunde- Paare bewältigt wurde, bestand aus mehreren Stationen, unter anderem aus einem zu durchlaufenden Schlauch, einem Slalom und Markierungen wo gewisse Befehle wie „Platz“ und „Sitz“ ausgeführt werden mussten. Diese Testsituationen wurden auf Video festgehalten. Nach der Bewältigung des Parcours wurde vom Hundebesitzer wiederum ein Fragebogen ausgefüllt, der sich auf die gestellten Aufgaben bezog.

Die Speichelprobenentnahmen des Hundes und des Hundehalters wurden kurz vor bzw. nach dem Parcours abgenommen. Dabei musste der Besitzer 30 Sekunden lang ein steriles Stück Polypropylengewebe (Salivette, Company Sarstedt) kauen. Dem Hund wurde von seinem menschlichen Partner ein Wattestäbchen wiederum für 30 Sekunden in den Mund gehalten. Um den Speichelfluss des Hundes zu stimulieren, wurde ihm während dieser Prozedur Futter präsentiert. Diese Interaktion wurde zur späteren Verhaltensanalyse auf Video aufgenommen. Danach waren Fragen bezüglich der Speichelprobeentnahme zu beantworten. Mit Hilfe der Speichelproben konnten die Hormonwerte, vor allem Kortisol, vor und nach dem Parcour bestimmt werden.

Von den Videos wurde Verhalten kodiert, um letztendlich die Qualität der Beziehung zwischen den zwei Partnern, d.h. die Synchronizität der Bewegungen und die Nähe bzw. Interaktionen zwischen Hund und Besitzer während einer Situation, in der sich der Besitzer auf die Bewältigung der Aufgabe konzentrieren musste, zu zeigen.

Wie erwartet, gab es zwei Gruppen von Performers: Teams mit Erfahrungen mit Agility-Parcours hatten eine höhere Synchronizität mit ihrem Hund und zeigten eine bessere Performance als andere Teams. Das Geschlecht spielte hierbei keine Rolle. Weibliche Besitzer sprachen mehr mit ihrem Hund, Männer benützten häufiger die Leine. Außerdem gab es jene Besitzer, die ihre Hunde eher als Kind und nicht als Partner betrachteten und dies spiegelte sich negative in der Performance wieder.

Männliche Besitzer hatten einen höheren Kortisol- Anstieg während des Parcours was ein Indiz für eine Stresssituation sein kann, weibliche Hunde hatten öfter einen Kortisol-Abfall. Dies könnte bedeuten, dass die Hündinnen den Parcours als Spielsituation gesehen haben.

Auch die Persönlichkeit des Besitzers hatte Einfluss auf die Interaktionen: neurotische Besitzer sprachen mehr mit ihrem Hund und gebrauchten weniger die Leine, da neurotische Menschen eine starke Beziehung zu ihrem Hunden hatten. Auch extravertierte Besitzer, die ihren Hund als Partner betrachteten, benützten selten die Leine.

2. Abstract

If humans and dogs are social partners, their interactions and performance as a team in an operational challenge should be affected, among other factors, by their personalities and their sex/gender combination. To explore this idea, we collected data at a fun-agility competition in Steyr (Upper Austria) in May 2007. Twenty-seven human-dog dyads (11 male and 16 female owners; 8 male and 19 female dogs, most of them of the dog breed "Eurasier"; www.eurasier-club-austria.at) were videotaped during mastering a fun-agility parcours as a team. Saliva samples for the analysis of cortisol were taken before and after. Questionnaires answered by the owners included the NEO-FFI personality test and an attitude-towards-dog scale. Videos were behaviour-coded with THE OBSERVER (Noldus). Principal component analysis (PCA) served to extract dimensions from the attitude questionnaire and data were analysed with GLMs. We found that owner gender and dog sex as well as personality of both partners affected dyadic performance in the agility parcours and salivary cortisol also. For example, male owners controlled their dogs more by holding them (restraining them physically) than female owners and male dogs were more controlled by holding than female dogs, independent of owner gender. Human partners in successfully performing teams praised their dogs more, held (physically restrained) them less and dogs were closer to their human partners than dogs in less successfully performing teams. We also found effects of the cortisol level, e.g. female dogs had more increases of the cortisol level during the parcours because they perceived the parcours as play situation and male owners had a higher decrease of the cortisol level because they had more stress than female owners. Also the personality of the owner had an effect on the interactions style: neurotic owners had a close attachment to their dogs and so they used more the verbal communication than the control by the leash during the parcours. Extraverted owners saw their dogs as companions during the practical task and so less hold behaviour was shown. By and large the human-dog dyads were separated into two groups: high and low performers. And there was an indication that owners, who saw their dogs a child, were worse than teams where the dog was seen as a companion.

Keywords: cooperation; dyadic interactions; human- dog dyads; human-dog teams; personality

3. Introduction

3.1. History of wolves/dogs and humans

Dogs (*Canis familiaris*) were the first animal species to live in close proximity to humans and have so for over 14.000 years (Benecke, 1995). It is widely accepted that dogs were domesticated from wolves, which have shared a common ecology and history with humans on the Northern hemisphere for over 400.000 years (Clutton-Brock, 1995). Pang et al. (2009) analyzed entire mitochondrial genomes of 169 dogs and the results indicated that the domestic dog originated in the southern china less than 16.300 years from several hundred wolves. Wolf taming was an important culture trait because time and place coincide approximately with the origin of rice culture. Dogs submitted to humans and became hunting companions and protectors of their villages. The exact nature of the interaction between humans and wolf that led to the domestication of the dog remains controversial. It was suggested that it was not so much a process induced by humans, much rather that wolves may have followed humans to benefit from being in their proximity (Schleidt and Shalter, 2003).
In evolutionary time dogs used human-like visual cues to communicate with humans and similar social cues enabled emotional bonding (Nagasawa, 2009).

3.2. Communication between dogs and human

Reid (2009) concluded that there are four basic interpretations for dog's responsiveness to human social cues:

1) Dogs simply have had more opportunity than other species to learn to be responsive to human social cues.
2) The domestication process provided an opening for dogs to apply general cognitive problem solving.
3) Dog's co-evolution with humans equipped them with a mental framework for social exchanges.
4) The sensitivity to the behaviours of both humans and other dogs would be particularly advantageous for a social scavenger like the dog.

For inter–specific- communication processes between human and dog, which is a dynamic system (Grammar, 2002), it is essential that humans interpret and respond. Humans do not find it difficult to recognise indifference, fear, friendliness, and play solicitation in the behaviour of their dogs. Tail movements are the most common cues for behaviour interpretation. However, humans may have problems with the interpretation of emotions such as aggression, confidence and play (Tami, 2009).

3.3. Personality of human and dogs

Personality influences communication and social relationships and has been shown to be a major factor in the dyadic relationship (Kotrschal et al 2009). According to Asendorpf & Wilpers, (1989), there is a correlation between personality and relationship quality like agreeableness prevents conflicts with opposite-sex peers and on the other side neuroticism is less relevant for establishing new relationships than shyness.

Many studies, e.g. Svartberg and Forkman (2002), Svartberg et al. (2005) and Gosling et al. (2003), investigate personality axes in animals. Five distinct traits have been proposed for the domestic dog: “Playfulness”, “Curiosity/Fearlessness”, “Chase-proneness”, “Sociability” and “Aggressiveness” on a continuum on a higher-order scale called “Shyness- Boldness” (Svartberg et al., 2005). Individual differences may result in different fitness levels and if some personality types are better for social living than others, then there should be a consistency of behavioural reactions over time in adult dogs. Calmness is influenced primarily by the dog’s age and boldness is affected by its sex and age. Other variables, like the owner’s age, education, previous experience with dogs and house living situation have minor, but detectable effects in the dog’s personality (Kubinyi et al., 2009). The social status of a dog has a stronger effect on its cognitive performance and its behaviour relating to humans, than its age and breed (Pongrácz, 2004).

Bennett and Rohlf (2006) could demonstrate that problematic behaviours of dogs, (assigned to 5 categories: disobedience, unfriendliness/ aggression, nervousness, anxiety/ destructiveness and excitability), was associated with characteristics of the dog owner. There is an association between dominance aggression in the dog and the anthropomorphic involvement of the owner and between over-excitement and displacement activities in the dog and anxiety in the owner (O’Farrell, 1997). To better understand the evolution and complexity of human personality, it was suggested by Ley and Bennett (2007) to investigate the personality of companion species, like dogs.

The personality of dog owners falls into one of the five categories of the Human Factor Models of Personality (FFM): “Neuroticism”, “Extraversion”, “Openness”, “Agreeableness” and “Conscientiousness”. These categories were first suggested during the 1930ies by Louis Thurstone. In 1999 Costa and McCrae produced a model to work with these five categories which was used since then by many research groups (e.g. Digman, 1996).

3.4. Gender differences

The gender of the dog owners accounts for differences in behaviour towards their pet. Women show higher levels of positive behaviour and attitude towards animals, such as protecting them. Men typically have higher levels of negative attitudes and behaviours, like hunting (Herzog, 2007). Pet attachment was not significantly related to gender, marital status or pet preference (dog versus cat), while it was nonlinearly related to age (Bagley & Gonsman, 2005).

Women use more verbal communication than men and they showed a shorter latency in starting talking. But there are no significant differences in affiliative and play behaviour. Male and female owners want to provide physical comfort for their dog (Prato-Previde et al., 2006). Another study by Kidd and Kidd (1980) showed that dog- loving men ranked high, both in dominance and aggression, dog-loving women ranked high in dominance too, but low in aggression. Finally women tend to be more emphatic and socially interested than men (reviewed in Hart, 1995).

Interactions with a self-confident male owner will involve that his dog will assume the beta-position. But the same dog will assume the social alpha role with a female owner and this will hardly produce a dominance conflict in woman- male dog dyads (reviewed in Kotrschal, 2009).

3.5. Other factors which influences the relationship between human and dog

The relation between self-esteem of the dog’s owner and the Big Five largely cuts across age, sex, social class and other aspects irrelevant for that study (Robins, 2001). Synchrony is an important factor to consider when investigating communication and personality between dogs and their owners. Well-trained dogs show a higher ability to solve tasks and they pay more attention to humans than to other performing dogs (Range et al. 2009).

Stressors such as noise, training and novelty have been reported to elicit responses in behavioural, cardiovascular, endocrine, renal, gastro-intestinal and haematological parameters (Beerda, 1997).
In our study we observed the behaviour and analysed changes in hormone levels (testosterone and cortisol) of humans and their dogs during the parcours to characterize the quality of attachment, dyadic relationship and functionality. The behaviour categories recorded included the dogs' confidence levels, vocalization by the dogs (i.e. whining and barking), frequency of vocalization and some elements involving movements (snout licking, paw lifting) associated with fear and submission (Beerda, 1997).
Dogs use three different coping styles for stress situations: first there are parallels between aggressiveness and proactive behaviour, second fearfulness and the reactive coping style and the third group of animals showed an ambivalent behaviour in a social threatening situation (Horváth, 2007).

3.6. Hormones

Hormones regulate social behaviour: testosterone values are associated with frequency of behaviours aimed at obtaining high status and cortisol is associated with changes in the frequency of social behaviours. For an example high cortisol levels indicate elevated stress (reviewed by Jones, 2006). In a study of a dog agility competition Jones and Josephs (2006) found that men's pre- competition basal testosterone levels were positively related to the changes in dog's cortisone levels from pre- to post- competition, but only among losing teams.
Hennessy (1996) studied dogs at a county animal shelter. He could show that cortisol concentrations at the end of a session were lower for dogs interacting with a female than those of dogs interacting with a male. He also showed that dogs seemed to be extremely sensitive to small differences in the quality or style of the human interaction. Behaviours associated with control, authority or aggression increase cortisol concentrations, while playing and affiliative behaviour decrease cortisol levels (Horvàth, 2008).
A dog is not only a social partner, but also has many beneficial effects on human health and behaviour (Serpell, 1991). Pets can be an efficient buffer to stress, regardless whether the human has a normal or elevated blood pressure (Allen, 2002; 2003). So the owners have fewer doctor visits than other people without pets (Headey & Grabka, 2007).

Dog owners feel safer in the vicinity of their dogs and dogs facilitate communication to strangers (Kotrschal & Ortbauer, 2003).

3.7. Hypothesis

This diploma thesis expands on the study by Kotrschal et al. (2009). In that study the data were collected and analysed in the same way: the questionnaires, videotaping and the saliva taking. The main differences between these two studies were that they needed instead of one meeting (the fun agility parcours) three meetings and that only male dogs were used. The results from 2009 showed for example that owner gender and personality influenced dyadic interaction style, dog behaviour and dyadic practical functionality and that there was a correlation between the personality of the owner and the strong of the attachment between owner and dog and that influenced the baseline cortisol levels of the dogs.
According to the score of their performance we assigned dyads to two performer groups: high performers (HP) and low performers (LP). The question was what the main differences between these two groups were. Was the behaviour and performance influenced of the owner's gender, the dog's sex, the personality of the owner or the kind of attachment and relationship between owner and dog?
One hypothesis of this study is that certain attachment patterns will correlate with hormonal changes. It is proposed that male dogs will have lower cortisol concentrations than female dogs and that self confident and extrovert owners will have active and play-loving dogs rather than frightened and withdrawn dogs.
Women will talk more and will have more interactions to their dogs. Male owners will try to be faster than other teams and will not take the time to communicate so much with their dogs (Prato-Previde et al., 2006). And some owners will see their dog as a child, whom they have to protect, others will see their pet as partner (O'Farrell, 1997).
The general aim of this study is to have a better understanding of the interactions between human and dog, which in turn should improve the knowledge basis for the human-animal-training.

4. Methods

4.1. Subjects

Subjects were recruited at the 2007 Eurasier Club meeting (www.eurasier-club-austria.at) in St. Ulrich, Upper Austria: Forty-eight dog owners (19 males and 29 females) and thirty-seven dogs (10 males and 27 females) participated in the study (different combinations: male owner & male dog: 8; male owner & female dog: 16; female owner & female dog: 29; female owner & male dog: 10). Some dog owners had more than one dog and some dogs had two or more than one companions (Tab.1).

Number of dogs	Number of owners	Number of Teams
1	1	15
1	2	8
1	3	1
2	2	4
2	4	1
3	2	1

Tab.1: The different combinations of dogs and owners: some dogs had more than one owner and some owner had more than one companion

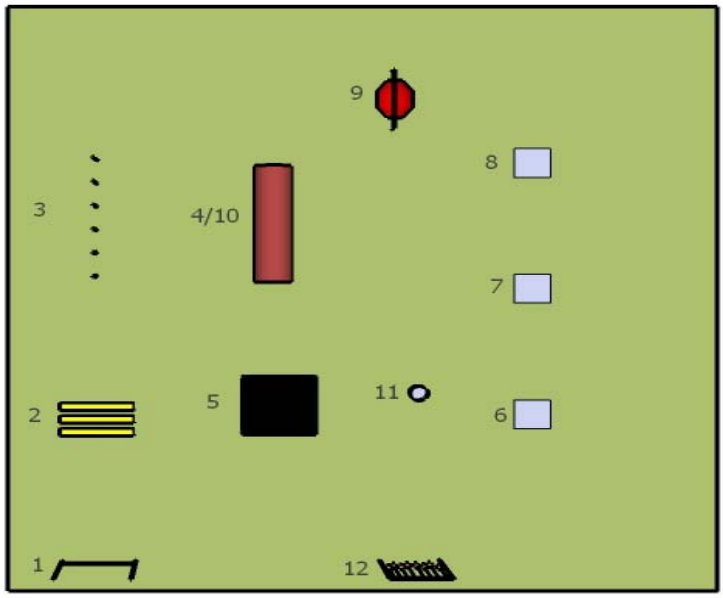
Almost all dogs were purebred Eurasier dogs, some were hybrids between Chow Chow x Eurasier (3), other breeds were Spitz- hybrids (1), Rhodesian ridgeback (1), Samojede (1) and Tervueren (1). Their weight ranged from 6 to 31 kg. The age of the dogs varied from one up to 12 years of age. All the dogs lived with their owners, either in a house or a flat (19), some of them had access to a garden (18). None of these dogs had spent part of their life in a kennel. The dog owners were aged between 8 and 66 years and had a range of occupations, such as students, medical doctors, farmers and so on. Only some of the dog owners had previous experience with an agility parcours (25).

4.2. Data collection

4.2.1. Questionnaires

The first point of the meeting was the registration of the owners and their dogs, for that some questionnaires had to be filled in. The registration questionnaires included 40 general items like name, address, age and living conditions (whether there were other animals or children) and the experience with agility contests.
In addition, dog owners answered 60 questions of the German version of the NEO-FII personality test (Five-Factor Inventory; Costa and McCrae, 1989; Borkenau and Ostendorf, 1993). Another questionnaire, which included questions from the “Questionnaire for Anthropomorphic Attitudes” proposed by Topal et al. (1997) and a scale translated and modified from “The Dog Attitude Scale” by Johannson (1999), asked for background information about the attachment and the relationship between owner and dog, e.g. if the owner liked to spend time with the dog and how he/she felt when the dog was quite close. After the parcours and the saliva and blood sampling, the owner was asked to complete another questionnaires relating to the stress situation for his/her dog.

4.2.2. Agility Parcours



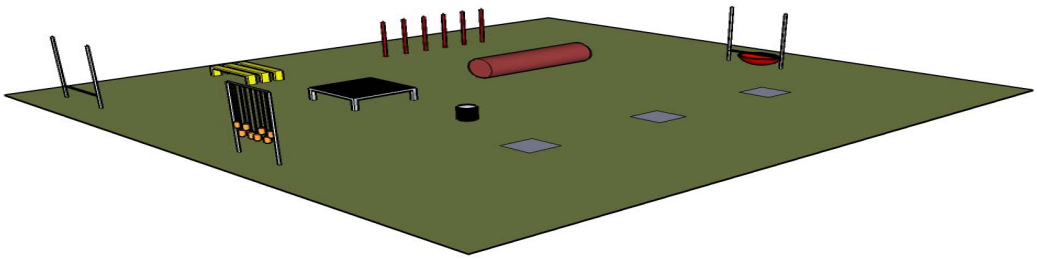


Fig.1a,b: The twelve station of the agility parcours: 1st a high jump; 2nd three low bars to jump over; 3rd a weave poles; 4th the tunnel; 5th the bridge; 6th sit; 7th down; 8th stand; 9th jump over a bar; 10th the tunnel; 11th search sausages out of a bowl with water and the 12th run under some suspended cans.

After registration 27 dogs (8 male and 19 female) and their owners (11male and 16 female) participated in a fun-agility parcours. The parcours consisted of twelve stations (Fig.1). Station 1 was a 50 cm high jump. Station 2 consisted of three low bars that the dogs had to jump over. This was followed by a weave poles (Fig.2a) station3 with six steps followed station 4: a tunnel (Fig.2b) that the dogs had to run through. On station 5, called “the bridge”, the dogs had to either sit or stand still for a short period (10 sec).

Then followed stations 6,7and 8 for different commands: “sit”, followed by “down”, then “stand”. At station 9 dogs had to jump over a bar again (Fig.2c). At station 10, the tunnel had to be passed. At station 11 the dogs had to eat a piece of sausages out of a bowl with water. For the last exercise, at station 12, the dogs had to run under some suspended tin cans (Fig.2d).

Fig.2a-d: **a)** 3rd station: the weave poles, **b)** 4th and 10th station: the tunnel, **c)** 9th station: jumping over a bar, **d)** 12th station: running under some suspended cans

There was no time limit for the exercises. The dog owners made their own decisions in which way to give commands, either verbally or with hand signals, whether to use the leash or not. A guide gave hints if necessary and rated the personality of the dogs while doing the contest. The subjects were videotaped during the agility competition with two hand held cameras (Sony DCR-TRV 19E) by two observers who took turns after each couple.

4.2.3. Saliva sampling

Preceding the parcours exercises and after that saliva samples of owners and dogs were taken. For saliva sampling mentioned above the dog owners were given two sterile polypropylene gauze (Salivette, Company Sarstedt) to chew for 30 seconds. Simultaneously the dog owner showed his/her dog some food to stimulate saliva flow of the dog. When successful, the owner collected the saliva sample with a safety cotton bud for babies (Fig.3).

Fig.3: The saliva taking from the dog by the owner with a safety cotton bud

4.2.4. Blood sampling

A veterinarian then took blood from the dogs for health checkups (Fig.4). This procedure was filmed with a camera on a tripod.

Fig.4: Blood sample taken by a veterinarian

4.3. Analysis

4.3.1. Analysis of questionnaires

All data were recorded on excel-files. The registration information could be copied into excel. For yes/no and female/male short cuts like 1/0 were used. The last three items relating to experiences with agility contests were scaled from 0 mm (never) to 92 mm (very often).
The scales from the other questionnaires relating to attitude had to be measured and the length was recorded in the Excel files.
Dog owner personality was scored with the NEO-FFI, a standardized analysis method for which a template was used. Each personality domain (neuroticism, extroversion, openness, agreeableness and consciousness) was allocated a specific number. The observations on stress management by the dogs in the different stress situation (saliva and blood sampling) were also measured. The dog's personality was scored by the guide during the agility parcours, by ticking a line between opposing attributes.
All these data were used for the statistical analyse in SPSS 15.0. A Principal Component Analysis (PCA) was calculated once for the personality of the dog and once for the human-dog relationship and attachment. For the personality of the dog the Principal Component Analysis (PCA; n= 27, Barlett- Test: KMO= 0,473; Sphericity: chi²=122,338, df=55, p<0,001; Varimax-rotation, Kaisernormalization) calculated with 11 personality items revealed 4 main axes: 1. stuffy, 2. calm, 3. attentive and 4. choosy (Tab.2).

	component			
	stuffy	calm	attentive	choosy
Playful	0,842	0,220	0,086	0,140
Interested	0,783	0,101	-0,225	0,099
Sociable	0,744	0,337	-0,062	-0,274
Relaxed	-0,734	0,132	0,383	-0,181
Active	0,614	-0,194	0,144	0,595
Calm-vocal	-0,123	0,921	-0,174	-0,136
Aggressive	0,297	0,761	-0,123	0,352
Balance	0,451	0,683	0,301	0,109
Anxious	-0,045	-0,034	0,876	0,260
Attentive	0,295	0,156	-0,736	0,452
Hoggish	-0,005	0,134	0,019	0,857

Tab.2: Principal Component Analysis (PCA) for the personality of the dog (n=27, Barlett-Test: KMO= 0,743; Sphericity: chi²=122,338, df= 55, p<0,001)

For the second PCA, for the human- dog relationship and attachment (PCA; n= 27, Barlett-Test: KMO= 0,705; Sphericity: chi²= 364,834, df= 91, p<0.001; Varimax-rotation, Kaisernormalization) performed with 7 human- dog relationship items and 7 human- dog attachment items revealed 4 main axes: 1. strong attachment, 2. (dog as a) free time partner, 3. (dog as a) social supporter, 4. (owner had an) important responsibility (Tab.3).

	component			
	strong attachment	free time partner	social supporter	important responsibility
Would be very sad if I would loose my do gor if the dog would be injured or sick	0,850	0,029	0,203	0,023
My dog means a lot to me	0,816	0,249	-0,030	0,196
My dog loves me unconditionally	0,703	0,123	0,207	0,052
I appreciate spending much time with my dog	0,473	0,375	0,160	0,363
I like simply hang around with my dog and relax	0,116	0,835	0,241	-0,094
Sometimes my dog makes me laugh	-0,002	0,660	0,143	0,393
Only through being together with my dog I feel good	0,392	0,634	0,155	0,020
I am missing my dog when we cannot be together	0,561	0,605	0,065	0,195
My dog doesn't know how I feel	-0,246	-0,010	-0,872	-0,106
I make sure that my dog always has access to fresh water	0,003	0,206	0,732	0,050
I improve by talking to my dog when I am sad, angry or in discomfort	0,210	0,266	0,680	0,183
Of all familiy members it is usually me who walkst he dog	0,273	-0,056	0,103	0,733
I like to teach my dog something	-0,297	0,303	0,386	0,608
In fact I spend much time with my dog	0,555	0,175	0,015	0,597

Tab.3: Principal Component Analysis (PCA) for human-dog relationship and attachment (n=27, Barlett-Test: KMO= 0,705; Sphericity: chi²=364,834, df= 91, p<0,001)

4.3.2. Analysis of video tapes

For video tape analysis the recordings were coded with THE OBSERVER Video Pro (Version 5.0) software. All observations were done by the same observer, therefore an intra-observation was done, one before (Cohen's Kappa: 82% in duration and 78% in frequency) and one after (Cohen's Kappa: 79% in duration and 77% in frequency) coding all videos. A second observer coded five sample sequences of one minute each, for inter-observer reliability. The values of the two observers were compared and showed over 79% agreements in duration (Cohen's Kappa: 78%) and over 75% in frequency (Cohen's Kappa: 75%).
For coding with the aid of The Observer sixteen behaviour classes were distinguished: dog interactions, dog posture locomotion, dog vocalization, owner posture locomotion, owner interactions, owner hold, owner vocalization, guide interactions, food task, tunnel, slalom, parcours, dog self- confidence, leadership, closeness and phases. Per items there were one to twenty- four different points to select, some were events (frequency), others states (duration). In addition to the behaviour independent variables were noted. After coding a video, 16 categories, made up of 4 independent variables plus the 12 stations of the parcours were graded- from one to four, and in most cases, to five.
The independent variables were: synchrony (was there a parallel walking etc. or not), interaction style quality (interaction style from the owner to the dog), intensity of owner's effort (how much did the owner try to complete the exercises), command (more verbal or hand command).

4.3.3. Analysis of saliva sampling

An enzyme immunoassay (EIA) was used to analyse the levels of cortisol and testosterone in the saliva samples of both, the dogs and their owners. Cortisol and testosterone was measured at the Department of Biochemistry at the University of Veterinary Medicine Vienna. Cortisol analysis was done as described by Palme and Möstl (1997); testosterone analysis following the method described by Palme and Möstl (1993). For stress analysis the cortisol and testosterone values before and after the parcours were compared.

4.3.4. Statistical analysis

For the statistical analyses the software SPSS 15.0 were used. Non parametric test (Kruskal-Wallis, Mann-Whitney-U-Test and Spermann-Rang-Test; always two sided) were used for data that did not show a normal distribution. The diagrams were created with the software of the SPSS 15.0 program.

5. Results

5.1. Gender differences

Teams participating in the parcours were separated into two groups (Tab.4) based on their performance score: a performance score from 15 to 24 classified them as “high performers” (HP), a score between 25 and 38 “low performers” (LP). Of the 27 human-dog dyads 16 were HP (31% male and 69% female owners; 44% male and 56% female dogs), 11 teams LP (46% male and 54 % female owners; 18% male and 82% female dogs).

	Male owner	**Male dog**	**Female owner**	**Female dog**	**Human-dog dyad**
High performers HP	31%	44%	69%	54%	**16**
Low performers LP	46%	18%	54%	82%	**11**

Tab.4: Percentages of high performers (HP) and low performers (LP) during a dog trial, based on the gender of dog owner and sex of dog

The gender of the owner and the sex of the dog did not influence the performance score of the parcours (Mann Whitney-U: Owner gender: n= 27, Z= -1.188, p= 0.235; Dog sex: n=27, Z= -1.359, p= 0.174). However, female owners tended to achieve higher marks than male owners and male dogs performed better than female dogs (Fig.5).

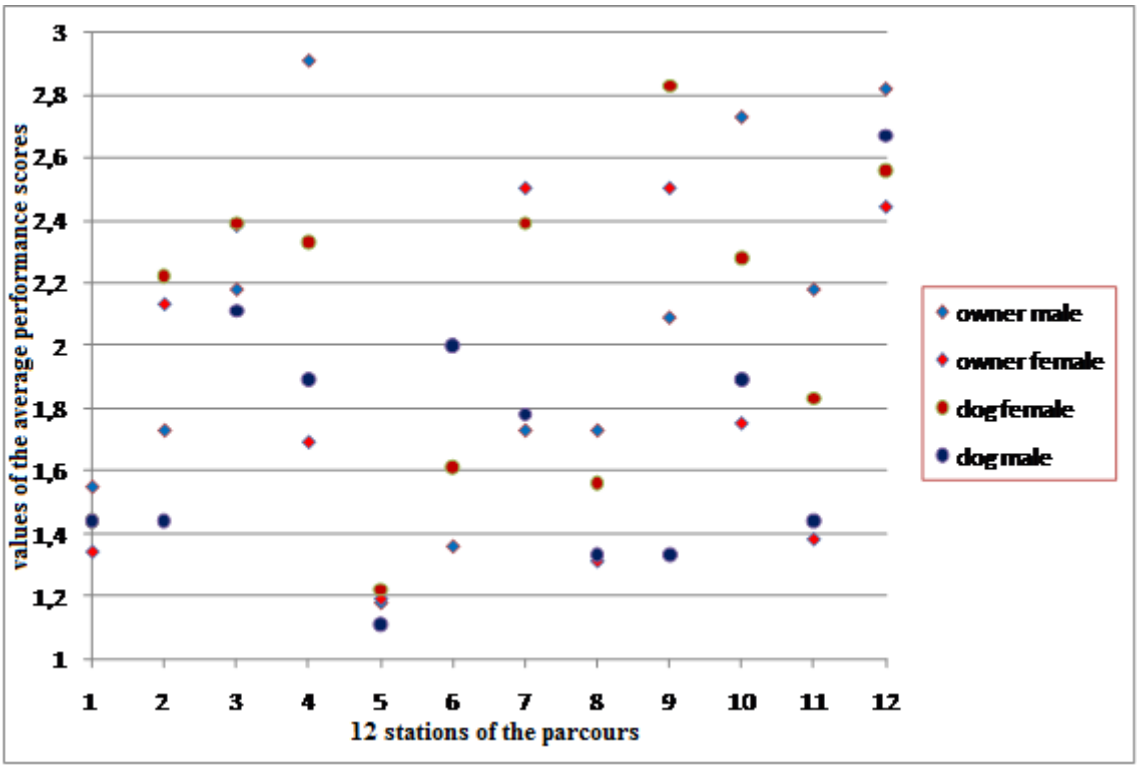


Fig.5: x-axis: the 12 stations of the parcours; y-axis: values of the average performance scores for each of the four variables: owner male/female and dog male/female

There was no evidence to suggest that either the gender of the dog owner or the sex of the dog influenced the interactions between owner and dog during the parcours, no significant effects in the behaviour of the team during the stress situation could be shown.

5.2. Owner personality

The personality of the dog owner had no significant influence on the performance score (Mann Whitney-U: Neuroticism: n= 25, Z= -0.945, p= 0.345; Extraversion: n= 25, Z= -0.945, p= 0.345; Openness: n= 25, Z= -0.666, p= 0.505; Agreeableness: n=25, Z= -0.000, p= 1.000; Consciousness: n= 25, Z= -0.250, p= 0.802).

Owners who felt an “important responsibility” (attachment and relationship PCA axes 4) and who had a “strong attachment” (attachment and relationship PCA axes 1) to their dogs were Low Performers, dogs of owners who considered them “social supporters” (Attachment and relationship PCA axes 3) were High Performers. Dogs as “free time partner” (Attachment and relationship PCA axes 2) did not score differently (Fig.6).

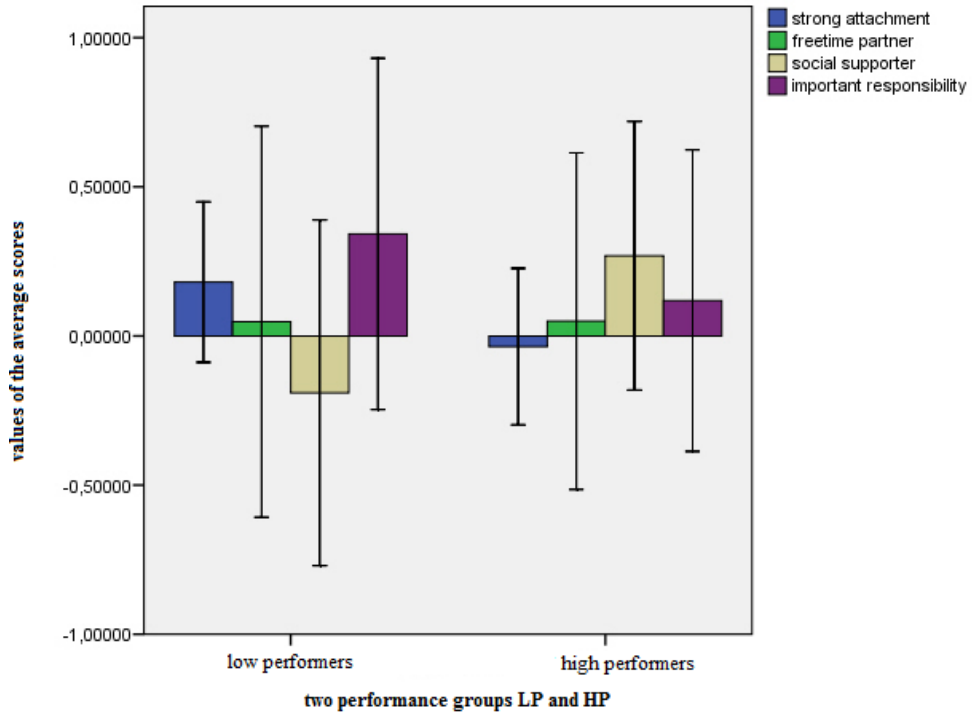


Fig.6: x- axis: 4 relationship and attachment categories (PCA) between owner and dog separated into the two performance groups LP (on the left) and HP (on the right); y-axis: values of the average scores.

The age of the dog owner had no significant effect on the performance score but on the strength of the "strong attachment" axes (Wald-Chi-Quadrat: 3.952, df= 1, p=0.047). Owners in the near of 20 and 55 years had a very lower attachment to their dogs than the other owners.

The effort of the owner during the parcours and the synchrony between owner and dog were significantly higher for HP than for LP (Mann Whitney-U: Synchrony: n= 27, Z= -2.243, p= 0.015; owners' effort: n=27, Z= -2.729, p= 0.006). LP needed more time to complete the parcours (1 min 44 sec to 4 min 5 sec) than HP (1 min 7 sec to 3 min 6 sec). In one case a LP did not complete the parcours successfully. The difference in completion time of the parcours was significant (Mann Whitney-U: n= 27, Z= -1.974, p= 0.048).

Previous experience with agility parcours also had a positive effect on the performance (Mann Whitney-U: n= 27, Z= -2.230, p= 0.026) and owners with previous experience rated their own performance as team highly (Mann Whitney-U: n=27, Z= -2.979, p= 0.003).

Owner vocalizations ratings during the parcours, such like the owner praising his/her dog and talking to the guide, were significantly different between HP and LP (Mann Whitney-U: "praising": n= 27, Z= -2.075, p= 0.038; "talking to guide": n=27, Z= -2.222, p= 0.026). There were no significant gender differences. HP praised more their dogs and LP talked more to the guide.

"Owner calling dog" was significantly and positively correlated with the neurotic axes of the owner's personality (Spearman-Rho: n=25, rs= 0.573, p= 0.003) and the 3rd axes of the PCA ("strong attachment": Sperman-Rho: n= 24, rs= 0.455, p= 0.026).

To separate the various variables and their influence on performance a generalized linear model (GLM) was applied to the behavioural class "no talking".

"No talking" was influenced by the gender of the owner, the sex of the dog, the interactions between owner and dog, the personality of the owner – except for the extraversion axes and three of the four PCA axes: strong attachment, free time partner and important responsibility ("interaction gender owner & sex dog = f001 * f005": Wald-Chi- Square= 50,632, df= 1, p<0.001; "gender owner": Wald-Chi- Square = 95,258, df= 1, p<0.001; "sex dog": Wald-Chi-Square= 7,269, df= 1, p=0,007; "neuroticism": Wald-Chi-Square= 107,670, df= 1, p<0.001; "openness": Wald-Chi-Square= 111,855, df= 1, p<0.001; "agreeableness": Wald-Chi-Square= 10,295, df=1, p= 0,001; "conscientiousness": Wald-Chi-Quadrat= 9,429, df= 1, p= 0,002; "strong attachment": Wald-Chi-Quadrat= 717,397, df=1, p<0.001; "free time partner": Wald-Chi-Quadrat= 125,555, df=1, p<0.001; "important responsibility": Wald-Chi-Quadrat= 39,580, df=1, p<0.001) (Tab.5).

Tests of the model effects

source	Typ III		
	Wald-Chi-Quadrat	df	Significance
(constant term)	52.435,547	1	0,000
f001 * f005 (interaction gender owner & sex dog)	50,632	1	0,000
f001 (gender owner)	95,258	1	0,000
f005 (sex dog)	7,269	1	0,007
f097 (neuroticism)	107,670	1	0,000
f099 (openness)	111,855	1	0,000
f100 (agreeableness)	10,295	1	0,001
f101 (conscientiousness)	9,429	1	0,002
FAC1_3 (strong attachment)	717,397	1	0,000
FAC2_3 (free time partner)	125,555	1	0,000
FAC4_3 (important responsibility)	39,580	1	0,000

Tab.5: Generalized linear model (GLM) with "no talk" by the owner to his dog as dependent variable

The distance between owner and dog was assigned to four categories: 1. next to the owner: dog is less than 10 cm away from owner, 2. close: dog is within reach 3. middle: distance up to 2 m and 4: distant: more than 2 m distance between owner and dog.

The categories close and middle significantly influenced the performance score. (Mann Whitney-U: “division close”: n=27, Z=- 2.122, p= 0.034; “division middle”: n=27, Z= -3.237, p= 0.001).

Holding behaviour was the extent of restraining the body of the dog, holding the leash and holding the collar. Similarly a Generalized Linear Model (GLM) was applied to separate various behavioural components from holding behaviour. Of all the variables tested (see table 6) only interactions between the gender of the owner and the sex of the dog were not significant (“gender of the owner”: Wald-Chi-Quadrat= 2 269.683, df= 1, p<0.001; ”sex of the dog”: Wald-Chi-Quadrat= 2 267.897, df= 1, p<0.001; “LP or HP”: Wald-Chi-Quadrat= 1 486.114, df= 1, p<0.001; neuroticism”: Wald-Chi-Quadrat= 22 340.362, df= 1, p<0.001; “extraversion”: Wald-Chi-Quadrat= 1 570.209, df= 1, p<0.001; “openness”: Wald-Chi-Quadrat= 2 724.749, df= 1, p<0.001; “agreeableness”: Wald-Chi-Quadrat= 6 749.613, df=1, p<0.001; “conscientiousness”: Wald-Chi-Quadrat= 11 279.216, df= 1, p<0.001; “strong attachment”: Wald-Chi-Quadrat= 714.215, df=1, p<0.001; “free time partner”: Wald-Chi-Quadrat= 1 340.304, df=1, p<0.001; “social partner”: Wald-Chi-Quadrat= 6 862.148, df= 1, p<0.001; “important responsibility”: Wald-Chi-Quadrat= 2 244.483, df=1, p<0.001).

Tests of the model effects

	Typ III		
	Wald-Chi-Quadrat	df	Significance
(constant term)	37.419,460	1	0,000
f001 (gender owner)	2.269,683	1	0,000
f005 (sex dog)	2.267,897	1	0,000
Badorgood (HP or LP)	1.486,114	1	0,000
f097 (neuroticism)	22.340,362	1	0,000
f098 (extraversion)	1.570,209	1	0,000
f099 (openness)	2.724,749	1	0,000
f100 (agreeableness)	6.749,613	1	0,000
f101 (conscientiousness)	11.279,216	1	0,000
FAC1_3 (strong attachment)	714,215	1	0,000
FAC2_3 (free time partner)	1.340,304	1	0,000
FAC3_3 (social partner)	6.862,148	1	0,000
FAC4_3 (important responsibility)	2.244,483	1	0,000

Tab.6: Generalized linear model (GLM) with hold behaviour, amount of holding leash, body and collar, as dependent variable.

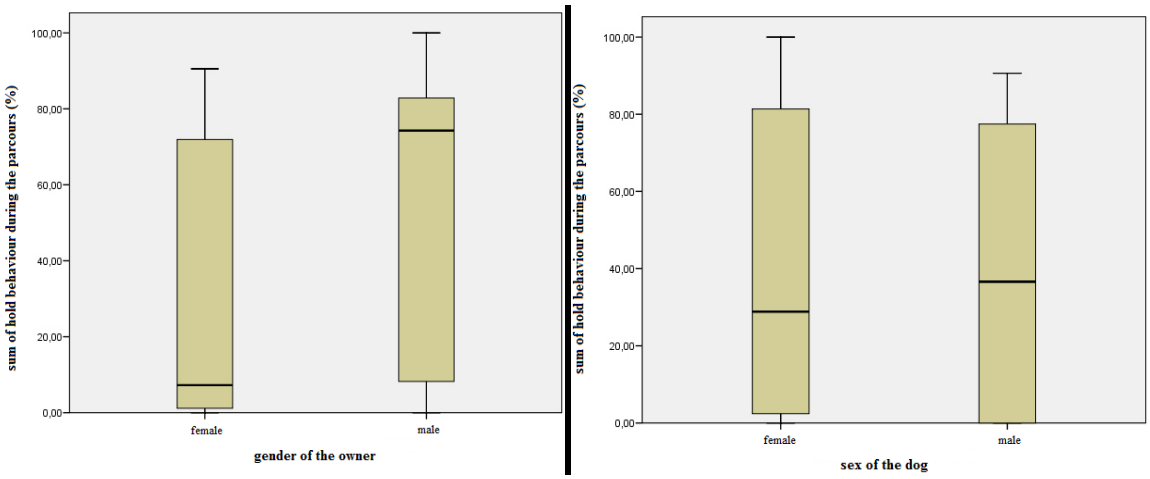


Fig.7 a-b: The first figure shows the sum of the hold behaviour during the parcours of female (left) and male (right) owners; the second figure shows the sum of hold behaviour during the parcours on female (left) and male (right) dogs.

Male owners showed more holding behaviour and male dogs were more controlled by holding them (Fig.7 a,b).

“Middle” was the only category significantly influencing holding behaviour (Mann Whitney-U: n= 27, Z= -2.123, p= 0.034).

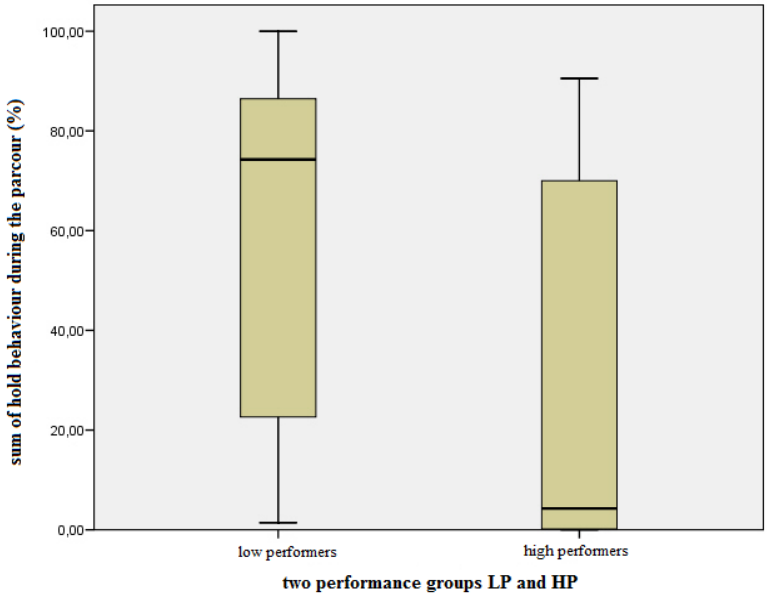


Fig.8: The figure shows the sum of holding behaviour during the parcours of high performers (right) and low performers (left).

Although there was a tendency for dyads from the HP to show less holding behaviour than LP, the difference was not significant (Mann-Whitney-U: n=27, Z= -1.878, p= 0,060) (Fig.8). The style of the command by the owner, be it command by hand or verbal, was not influenced by his/her personality, the kind of relationship and attachment to the dog, his/her gender, the dog’s sex or the performance rating during the parcours.

Tests of the model effects

source	Total of squares of Typ III	df	Averages of squares	F	Significance
corrected model	552,384(a)	1	552,384	8,964	0,006
constant term	57.144,800	1	57.144,800	927,364	0,000
f005 (sex dog)	552,384	1	552,384	8,964	0,006
error	1.540,516	25	61,621		
total	62.236,085	27			
corrected total variation	2.092,901	26			

Tab.7: GLM of owner interaction to his/her dog (%)

Duration of the owner's orientation to his/her dog was significantly related to the sex of the dog (General Linear Model: Averages of Square = 552.384, df= 1, p= 0.006) (Tab.7), male dogs were more looked at by their owners (Fig.9).

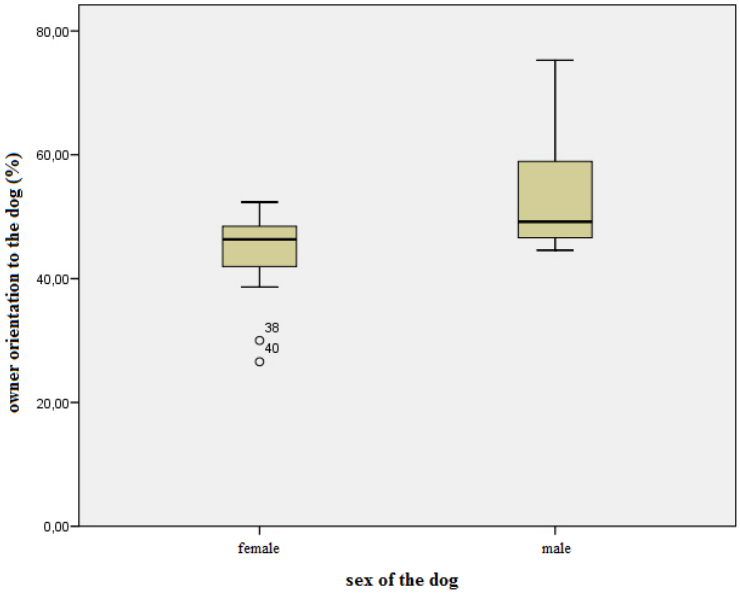


Fig.9: x-axis: the sex of the dog (female on the left and male on the right side), y-axis: duration of owner orientation dog

The amount of interactions by the dog directed towards its owner (sniff owner, orientation owner and play behaviour) were significant to the 3rd PCA axes ("strong attachment") of relationship and attachment between owner and dog (general linear model: Averages of Squares= 1 609.847, df= 1, p= 0.025) (Tab.8).

Tests of the model effects

Source	Total of squares of Typ III	df	Averages of squares	F	Significance
Corrected model	1609,847(a)	1	1.609,847	5,807	0,025
Constant term	55.930,108	1	55.930,108	201,764	0,000
FAC1_3 (strong attachment)	1.609,847	1	1.609,847	5,807	0,025
Error	6.098,529	22	277,206		
Total	66.045,066	24			
Corrected total variation	7.708,376	23			

Tab.8: GLM oft the amount of interactions by the dog to its owner (sniff owner, orientation owner and play behaviour)

5.3. Hormones

In most cases cortisol levels increased during the parcours, only 5 owners (3 male and 2 female) showed a decrease. In 4 dog owners (1 male and 3 female) cortisol level increased by less than 0.5 ng/ml and was rated minimal. 4 male dog owners showed an increase of over 10 ng/ml. The demonstrator of the parcours (male) had a starting cortisol value of over 27 ng/ml, which is considered extremely high (Fig.10). His dog (male) also had a high starting cortisol value (>4 ng/ml), so did one other male and one female dog. 6 dogs (2 males and 4 females) showed a decrease in their cortisol levels and 3 female dogs had a minimal increase (<0,1 ng/ml) during the parcours.

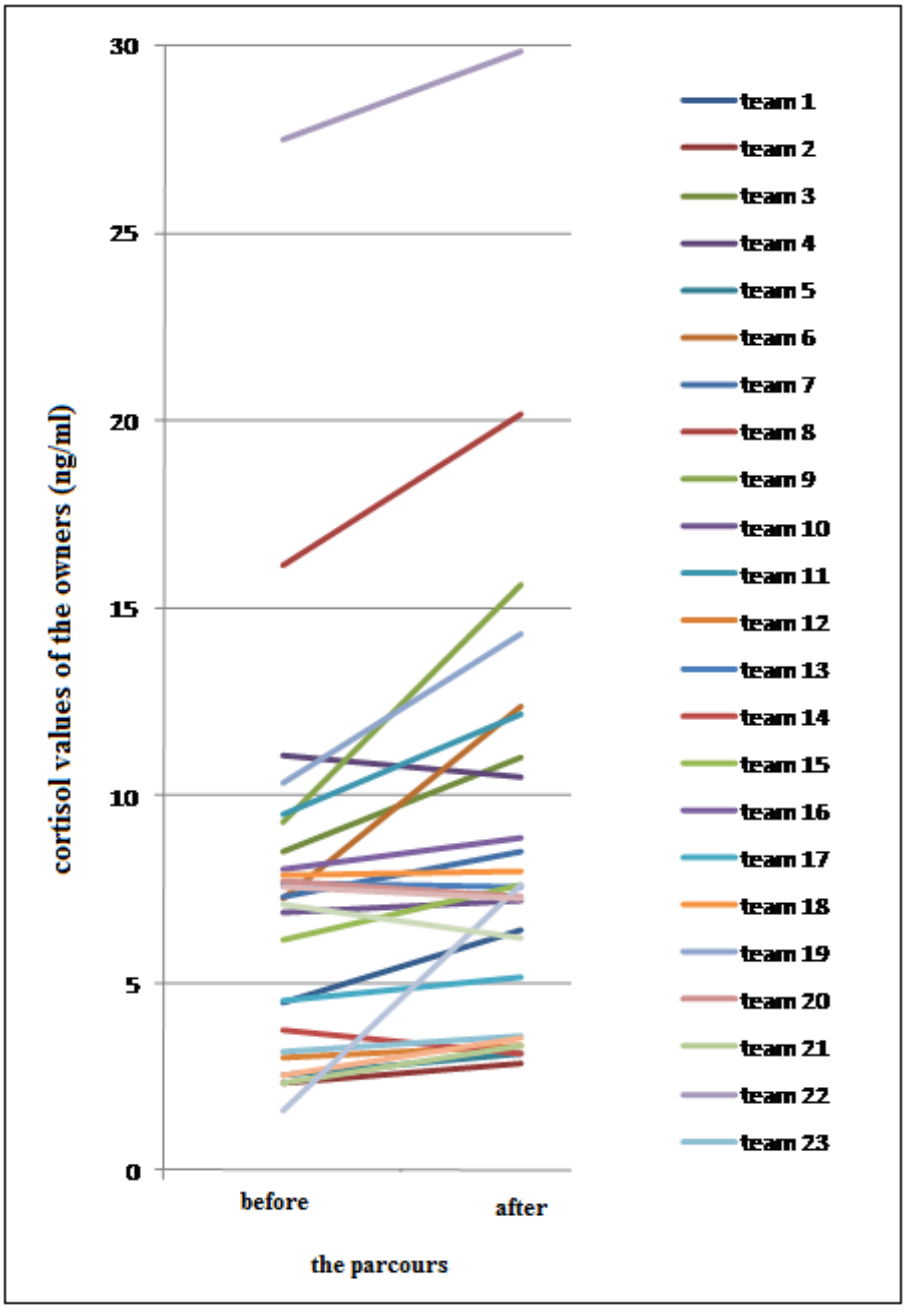


Fig.10: x-axis: before and after the parcours, y-axis: the cortisol value of the 27 owners (ng/ml)

There were no factors, calculated with a general linear model, which had an effect on the cortisol concentration of the owner during the parcours.

Tests of the model effects

Source	Total of squares of Typ III	df	Averages of squares	F	Significance
Corrected model	17,389(a)	5	3,478	3,711	0,017
Constant term	2,283	1	2,283	2,436	0,136
f097 (neuroticism)	4,734	1	4,734	5,051	0,037
f100 (agreeableness)	5,731	1	5,731	6,115	0,024
f101 (consciousness)	9,113	1	9,113	9,724	0,006
FAC3_3 (social supporter)	4,270	1	4,270	4,556	0,047
FAC4_3 (important responsibility)	8,773	1	8,773	9,361	0,007
Error	16,870	18	0,937		
Total	710,434	24			
Corrected total variation	34,258	23			

Tab.9: GLM of the cortisol difference of the begin and end value of the dog

The cortisol concentration of the dog during the test situation was influenced by several factors (Tab.9): analysed with a general linear model: “neuroticism” (Averages of Squares= 4.734, df= 1, p= 0.037), “agreeableness” (Averages of Squares= 5.731, df= 1, p= 0.024), “consciousness” (Averages of Squares= 9.113, df= 1, p= 0.006), “social supporter” (Averages of Squares= 4.270, df= 1, p= 0.047) and “important responsibility” (Averages of Squares= 8.773, df= 1, p= 0.007). The graphics showed that the more neurotic and conscious and the less agreeable the owner the higher was the increase of the cortisol level of the dog during the 6parcours. The less high the values of the 3rd PCA axes (social supporter) and the 4th PCA axes (important responsibility) the higher was the increase of the cortisol level of the dog. There were no correlations between the age of the dogs and any other factors or behaviour, like the cortisol value of the dog, the rate of play behaviour shown during the parcours or the commando style of the owner.

6. Discussion

First at all the kind of attachment and relationship between owner and dog was important: Owners who saw their dogs as “social supporters” scored higher than owners who felt an “important responsibility” and a “strong attachment” to their dog. A study by O’Farrell (1994) showed that many owners see their pets as their own child, which has to be feed and cared for. This over-excitement of the owner should have a negative effect on the performance which is reflected in this study. Another study by Topàl et al (1997) showed that some owners regard their dogs as a close friend, others as buddies in joint activities and for still others their dogs are merely backyard animals.

It is obvious that people showing more effort during a test situation will pass it more successfully and so will a higher degree of the synchrony, which is based on the dyad’s previous experiences with agility competitions. Dogs and their owners with no experience will have more problems than the other teams. A study by Range et al. (2009) showed that well-trained dogs show a higher ability to solve tasks.

High performers were closer to each other, because the owners had better control of their dogs, due to a higher interaction rate. Dogs of the low performing dyads didn’t know what to do and therefore were often distant from their owner. Hold behaviour was also influenced by the outcome of the performance; the more holding behaviour was shown during the parcours, the worse the team performed. Owners tried to compensate for poor performance by controlling their dogs.

Like the previous study by Kotrschal et al. (2009) had shown, gender influenced the dyadic interaction style: Female owners talked more to their dogs and owners talked less to their male dogs. It can be possible that men were more inhibited than women in talking to their dog by the presence of the video camera (Prato-Previde, 2006).

But there were no difference in the positive behaviour, like “praising dog” and “giving treat” between male and females, as previously documented in a study by Herzog (2007). The results of this study confirm the statement by Prato-Previde et al. (2006) that women use more verbal communication and that there are no significant differences in play behaviour (interactions between the owner and his/her dog).

Holding behaviour was influenced by the gender of the owner and the sex of the dog: male owners exerted their control more by holding their dogs and male dogs were held more by their owners. This showed that women tried to maintain their control by verbal

communication, whereas males tend to exert control by the leash. Holding behaviour was also influenced by the kind of relationship and attachment between the dyads: the stronger the attachment and the more the owner felt responsible for his/her dog and the more the owner perceived his/her dog as a spare time partner, the longer the duration of the holding behaviour. The more the dog was perceived as social support the less holding behaviour was shown. This supports again the results of the study by O'Farrell (1994), because owners who treat their dogs like a child will try to control them more by holding behaviour.

Hormone analysis also showed some gender differences: Only male owners had a higher cortisol increase during the parcours of over 10 ng/ml. High cortisol levels mark elevated stress and can occure when an individual loses a competition (reviewed in Jones, 2006). More female dogs showed a decrease in the cortisol level. A decrease of the dogs' cortisol levels could indicate that the dogs experienced the test situation more like a play situation (Horvàth et al., 2008). Hennessy (1997) showed that dogs, which interacted with women had lower cortisol concentration at the end of a session.

The personality of the owner was earlier looked at by Kotrschal et al. (2009). They showed that the neurotic and extraverted personality axes of the owner were particularly important for the interactions with their dogs: Neurotic owners were more closely attached to their dogs however such dyads were not so good partners in shared activities and owners scored high in extraversion considered their dogs as companions for shared activities. Our study showed that neurotic and agreeable owners talked more to their dogs than open and conscientious ones. The more neurotic, extraverted, open, agreeable or conscious the owner, the shorter the duration of the holding behaviour during the parcours. That means neurotic owners had a close attachment to their dogs and so they used more the verbal communication than the control by the leash during the parcours. Extraverted owners saw their dogs as companions during the practical task and so less hold behaviour was shown.

The last result to discuss was that owners in near of 20 and 55 years had a very lower attachment to their dogs than the others. Weaker attachments showed that the owners were consistently less satisfied with most aspects of the dog's behaviour than owners with strong attachments (Serpell, 1996).

At the end some marginal notes: Our results are based on a sample size of only 27 teams with more female owners (59%) and more female dogs (80%) participating. Thus, the comparison between the genders is inconclusive.

Although most of the dogs were from the breed Eurasier and thus would have provided a homogeneous background for comparison, the results of the PCA of dog personality were not used for analysis, since dog personality was rated by a guide during the parcours.
Starting the statistical analysis two separated PCA were created: one for the relationship and one for the attachment. Due to their low KMO- values and their weak results the two PCA were combined into one.
Video materials of the blood and saliva sampling were not used for analysis, due to their poor qualities.

7. References

- Allen, K. et al. (2002). Cardiovascular Reactivity and the Presence of Pets, Friends and Spouses: The Truth About Cats and Dogs. Psychosomatic Medicine, 64, 727-739.
- Allen, K. (2003). Are Pets a Healthy Pleasure? The Influence of Pets on Blood Pressure. Psychological Science, 12(6), 236-239.
- Asendorpf, J.B. & Wilpers, S. (1998). Personality Effects on Social Relationships. Journal of Personality and Social Psychology, 74(6), 1531-1544.
- Bagley, D.K. & Gonsman V.L. (2005). Pet attachment and personality type. Anthrozoös, 18(1), 28-41.
- Beerda, B. et al. (1997). Manifestations of chronic and acute stress in dogs. Applied Animal Behaviour Science, 52, 307-319.
- Benecke, N. (1995). Mensch-Tier Beziehung im Jung- und Spätpaläolithikum. In: Ed. Ulrich H. Man and Environment in the Paleolithic. E. R. A. U. L., 62: 77-87.
- Bennett, P.C. & Rohlf, V.I. (2007). Owner-companion dog interactions: Relationships between demographic variables, potentially problematic behaviours, training engagement and shared activities. Applied Animal Behaviour Science, 102, 65-84.
- Borkenau, P. & Ostendorf, F. (1993). NEO- Fünf- Faktoren Inventar (NEO-FFI) nach Costa und McCrae, Göttingen, Hogrefe.
- Clutton-Brock J. (1995). In: Ed. Serpell J. The domestic dog: Its evolution, behaviour and interaction with people. Cambrige University Press: Cambridge, 7-20.
- Costa, P.T. & McCrae, R.R. (1989). The NEO PI/FFI manual supplement. Odessa, Florida: Psychological Assessment Resources.

- Costa, P.T. & McCrae, R.R. (1999). A Five- Factor Theory of Personality. In: Pervine, L.A. & John, O.P. (Eds.): Handbook of personality: Theory and research (second edition; pp. 139-153). New York: Guilford Press.
- Digman, J.M. (1996). The curious history of the five-factor model. In: The Five Factor Model of Personality: Theoretical Perspectives, 1-20, ed. J.S. Wiggins. London: The Guilford Press.
- Gosling, S. D. et al. (2003). A Dog's Got Personality: A Cross-Species Comparative Approach to Personality Judgments in Dogs and Humans. Journal of Personality and Psychology, 85, 1161-1169.
- Grammar, K. et al. (2002). Dynamic Systems and Inferential Information Processing in Human Communication. Neuroendocrinology Letters, 23, 15-22.
- Hart, L. (1995). Dogs as human companions: a review of the relationship. In Serpell, J. (Ed.), The domesticated dog: Its evolution, Behaviour and interaction with people. Cambridge University Press, Cambridge, UK, pp. 161- 178.
- Headey, B. & Grabka, M. M. (2007). Pets and human health in Germany and Australia: national longitudinal results. Springer, Social Indicators Research, 80, 297-311.
- Hennessey, M.B. et al. (1997). Plasma Cortisol Levels of Dogs at a County Animal Shelter. Physiology & Behaviour, 62(3), 485-490.
- Herzog, H.A. (2007). Gender Differences in Human-Animal Interactions: A Review. Anthrozoös, 20(1), 7-21.
- Horváth, Z. et al. (2007). Three different coping styles in police dogs exposed to a short- term challenge. Hormones and Behaviour, 52, 621-630.

- Horvàth, Z. et al. (2008). Affiliative and disciplinary behaviour of human handlers during play with their dog affects cortisol concentrations in opposite directions. Hormones and Behaviour, 54, 107-114.
- Johannson, E. E. (1999). Human- animal bonding: an investigation of attributes. PhD Thesis University of Alberta.
- Jones, A.C. & Josephs, R. A. (2006). Interspecies hormonal interactions between man and the domestic dog (Canis familiaris). Hormones and Behavoiur, 50, 393-400.
- Kidd, A.H. & Kidd, R.M. (1980). Personality characteristics and preferences in pet ownership. Psychological Reports, 52, 719-729.
- Kotrschal, K. et al. (2009). Dyadic relationships and operational performance of male and female owners and their male dogs. Behavioural Processes, 81, 383-391.
- Kotrschal, K. & Ortbauer, B. (2003). Behavioural effects of the presence of a dog in the classroom. Anthrozoös, 16, 147-159.
- Kubinyi, E. et al. (2003). Social mimetic behaviour and social anticipation in dogs: preliminary results. Animal Cognition, 6, 57-63
- Kubinyi, E. et al. (2009). Dog and owner demographic characteristics and dog personality. Behavioural Processes, 81, 392-401.
- Ley, J.M. & Bennett, P.C. (2007). Understanding Personality by Understanding Companion Dogs. Anthrozoös, 20(2), 113-124.
- Nagasawa, M. et al. (2009). Attachment between humans and dogs. Japanese Psychological Research, 51(3), 209-221.
- O'Farrell, V. (1994). Dog's Best Friend. Methuen, London.
- O'Farrell, V. (1997). Owner attitudes and dog behaviour problems. Applied Animal Behaviour Science, 52, 205-213.

- Palme, R. & Möstl, E. (1993). Biotin- Streptavidin enzyme immunoassay for the determination of oestrogens and androgens in boar faeces. In: Advances of Steroid Analysis'93 (S. Görög, ed.), Akademiai Kiado Budapest 94, (Proc. Of the 5th Symposium on the Analysis of Steroids, Szombathely, Hungary), 111- 117.
- Palme, R., & Möstl, E. (1997). Measurement of cortisol metabolites in faeces of sheep as a parameter of cortisol concentration in blood. International Journal of Mammalian Biology, 62 (Supplement 2), 192-197.
- Pang, J.F. et al. (2009). mtData indicates a single origin for dogs south of Yangtze river, less than 16,300 years ago, from Numerous wolves. Manuscript.
- Pongrácz, P. et al. (2004). The pet dogs ability for learning from a human demonstrator in a detour task is independent from the breed and age. Applied Animal Behaviour Science, 90, 309-323.
- Prato- Previde, E. et al. (2006). Gender Differences in Owners Interacting with Pet Dogs: An Observational study. Ethology, 112, 64-73.
- Range, F. et al. (2009). The effect of ostensive cues on dogs' performance in a manipulative social learning task. Applied Animal Behaviour Science, 120, 170-178.
- Reid, P.J. (2009). Adapting to the human world: Dog's responsiveness to our social cues. Behavioural Processes, 80, 325-333.
- Robins, R.W. et al. (2001). Personality Correlates of Self-Esteem. Journal of Research in Personality, 35, 463-482.
- Serpell, J. (1991). Beneficial effects of pet ownership on some aspects of human health and behaviour. Journal of the Royal Society of Medicine, 84, 717-720.
- Serpell, J. (1996). Evidence for an association between pet behaviour and owner attachment levels. Applied Animal Behaviour Science, 47, 49-60.

- Schleidt, W.M. & Shalter, M.D. (2003). Co-evolution of Humans and Canids. An Alternative View of Dog Domestication: Homo Homini Lupus? Evolution and Cognition 9, 57-72.
- Svartberg, K. et al. (2005). Consistency of personality traits in dogs. Animal Behaviour, 69, 283-291.
- Svartberg, K. & Forkman, B. (2002). Personality traits in the domestic dog (canis familiaris). Applied Animal Behaviour Science, 79, 133-155.
- Tami, G. & Gallagher, A. (2009). Description of the behaviour of domestic dog (Canis familiaris) by experienced and inexperienced people. Applied Animal Behaviour Science, 120, 159-169.
- Topàl, J. et al. (1997). Dog-human relationship affects problem solving behaviour in the dog. Anthrozoös, 10, 214-223.

8. Appendices

8.1. Appendix A

Anmeldung

zur Teilnahme an der Studie „Mensch-Hund-Beziehung“ der Universität Wien, der Konrad-Lorenz-Forschungsstelle und des IEMT Wien im Rahmen des ECA-Jahrestreffens in St.Ulrich/Steyr

Für die Teilnahme an der Studie wird jedem Mensch-Hund-Team eine Team-Nummer zugeteilt, wodurch die Untersuchung anonym durchgeführt werden kann. Die persönlichen Daten werden vertraulich behandelt und nicht an Dritte weitergegeben.

Wenn Sie mit mehreren Hunden teilnehmen, füllen Sie bitte für jeden Hund je ein Anmeldungsformular aus.

Team-Nummer:
1. Name:
2. Adresse:
3. Telefonnr.:
4. Email:
5. Name des Hundes:

.....

Einverständniserklärung

Ich erkläre mich hiermit einverstanden, dass ich gemeinsam mit meinem Hund im Zuge der Datenaufnahme für die Studie „Mensch-Hund-Beziehung“ gefilmt werde.

Datum Unterschrift

8.2. Appendix B

Fragebogen zum Lebensumfeld des Mensch-Hund-Teams - Team ___

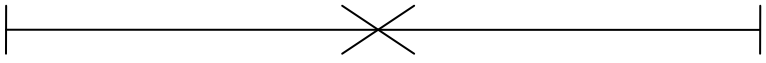
Bitte füllen Sie folgende Fragen so gewissenhaft und ehrlich wie möglich aus.
Es gibt keine „richtigen“ oder „falschen“ Antworten, bitte füllen Sie alle Fragen nach Ihrem Gefühl aus.

Alle Fragen und Aussagen in diesem Fragebogen beziehen sich auf das an der Studie teilnehmende Mensch-Hund-Team.
Sollten Sie mehrere Hunde besitzen, so beantworten Sie die Fragen bezüglich „Ihres Hundes“ in Bezug auf jenen Hund, mit dem Sie an dieser Studie teilnehmen. Sollten Sie mit mehreren Hunden an dieser Studie teilnehmen, so füllen Sie bitte für jeden Hund jeweils einen eigenen Fragebogen aus (zugehörige Team-Nummer laut Anmeldung). Sie werden in diesem Fragebogen als „Bezugsperson“ bezeichnet.

Je nach Art der Fragestellung bitte zutreffenden Punkt oder zutreffende Position auf der Skala ankreuzen. Bitte beachten Sie, dass die Skalen seitlich begrenzt sind, und diese vollständig genutzt werden können (siehe Beispiele).
Bitte auch alle Unterfragen beantworten!

Falls Sie sich bei Ihrer Antwort geirrt haben, diese bitte deutlich durchstreichen und die für Sie zutreffende Antwort ankreuzen.
Falls Sie eine Frage nicht verstehen, wenden Sie sich bitte an uns.
Beispiele:

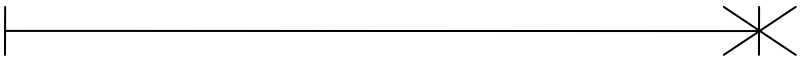
x) Wie oft gehen Sie mit ihrem Hund wandern?



nie *sehr oft*

(Ich gehe manchmal mit meinem Hund wandern)

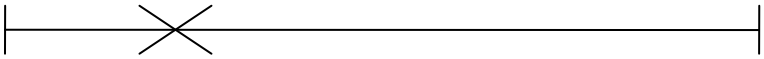
xi) Wie oft gehen Sie mit ihrem Hund wandern?



nie *sehr oft*

(Ich gehe sehr oft mit meinem Hund wandern)

xii) Wie oft gehen Sie mit ihrem Hund wandern?



nie *sehr oft*

(Ich gehe nie mit meinem Hund wandern)

Der Fragebogen wird anonym und vertraulich behandelt.

Wir danken Ihnen, dass Sie sich die Zeit nehmen, diesen Fragebogen auszufüllen!!

1) Geschlecht der Bezugsperson:

2) Geburtsdatum der Bezugsperson:

3) Beruf der Bezugsperson:

4) Rasse Ihres Hundes:

5) Geschlecht Ihres Hundes:

6) Ist Ihr Hund kastriert?
   - o Nein
   - o Ja

7) Geburtsdatum Ihres Hundes (wenn nicht bekannt: Alter des Hundes):

8) Gewicht Ihres Hundes:

9) Bekommt Ihr Hund zum Zeitpunkt der Datenaufnahme Medikamente?
   - o Nein
   - o Ja

     Wenn ja, welche Medikamente bekommt er mit welcher Dosierung?

10) Leidet Ihr Hund an chronischen Krankheiten?
   - o Nein
   - o Ja

     Wenn ja, an welchen Krankheiten leidet Ihr Hund?

11) Leidet Ihr Hund im Moment an einer Krankheit?
   - o Nein
   - o Ja

     Wenn ja, an welcher Krankheit leidet Ihr Hund?

12) Wo verbringt Ihr Hund die meiste Zeit?
   - o in der Wohnung / im Haus
   - o im Garten
   - o im Zwinger

13) Sind Sie die Hauptbezugsperson Ihres Hundes?
   - o Nein
   - o Ja

14) Leben Sie mit Ihrem Hund in einem gemeinsamen Haushalt?
   - o Nein
   - o Ja

15) Wie alt war Ihr Hund, als Sie ihn übernommen haben?

16) Sind Sie Erstbesitzer Ihres Hundes?

- o Nein
- o Ja

17) Von wo haben Sie Ihren Hund übernommen?

18) Wie viele Personen leben insgesamt im selben Haushalt wie Ihr Hund?

Davon Kinder unter 14 Jahren:

19) Leben andere Hunde im selben Haushalt wie Ihr Hund?

- o Nein
- o Ja

Wenn ja,

wie viele:

seit wann:

Rasse:

Alter:

Geschlecht:

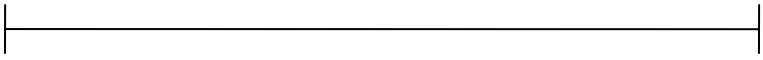
Kastriert:

20) Leben weitere Tiere im selben Haushalt wie Ihr Hund?

- o Nein
- o Ja

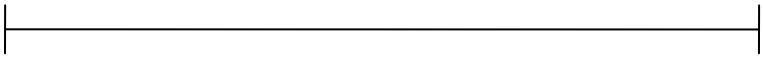
Wenn ja, welche und wie viele:

21) Wie oft haben Sie mit Ihrem Hund bereits als Team Agility betrieben?



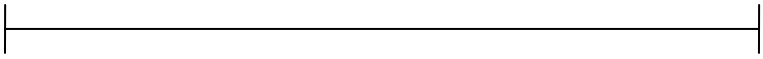
nie *sehr oft*

22) Wie oft haben Sie mit Ihrem Hund bereits als Team bei einem Agility-Turnier teilgenommen?



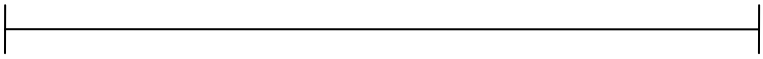
nie *sehr oft*

23) Wie gut, denken Sie, haben Sie diese Agility-Turniere als Mensch-Hund-Team gemeistert?



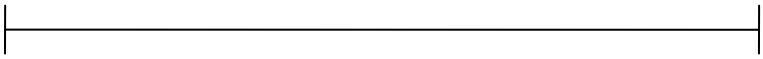
sehr schlecht *sehr gut*

24) Ich bringe meinem Hund gerne was bei.



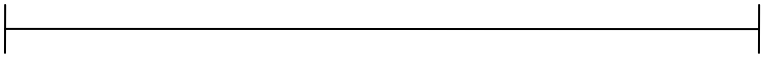
starke Ablehnung starke Zustimmung

25) Von allen Familienmitgliedern gehe ich gewöhnlich mit dem Hund Gassi/spazieren.



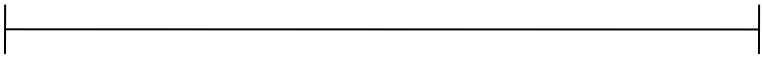
starke Ablehnung starke Zustimmung

26) Ich gehe mehrmals pro Woche ausführlich mit meinem Hund spazieren oder trainiere/spiele (z.B. Ballspiel, Frisbee) mehrmals pro Woche mit dem Hund.



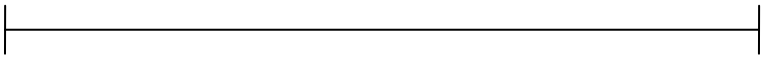
starke Ablehnung starke Zustimmung

27) Selbst wenn andere Familienmitglieder anwesend sind, wendet sich mein Hund an mich wenn sie/er hinaus will.



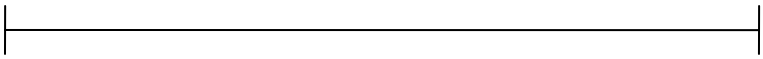
starke Ablehnung starke Zustimmung

28) Ich stelle sicher, dass mein Hund immer frisches Wasser hat.



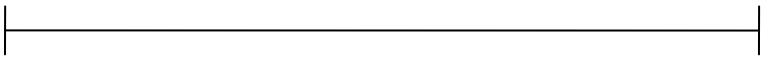
starke Ablehnung starke Zustimmung

29) Ich bin tagtäglich alleine dafür verantwortlich, meinen Hund zu füttern.



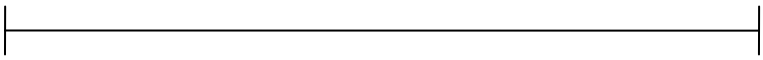
starke Ablehnung starke Zustimmung

30) Mein Hund ist eine Nervensäge.



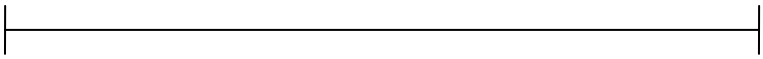
starke Ablehnung starke Zustimmung

31) Mein Hund fordert oft Aufmerksamkeit, wenn ich zu sehr beschäftigt bin.



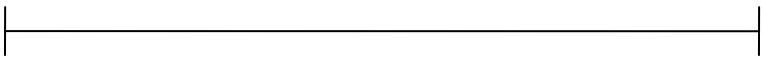
starke Ablehnung starke Zustimmung

32) Mein Hund ist wirklich klug und pfiffig.



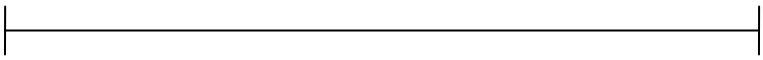
starke Ablehnung starke Zustimmung

33) Mein Hund ist ziemlich doof.



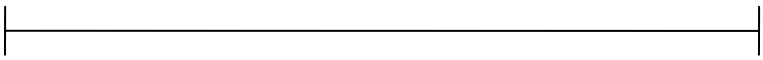
starke Ablehnung starke Zustimmung

34) Ich glaube, mein Hund versteht mich.



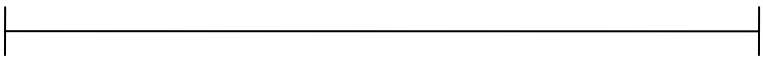
starke Ablehnung starke Zustimmung

35) Es ist ein gutes Gefühl, mit meinem Hund zu reden.



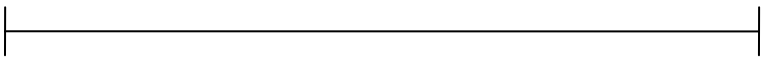
starke Ablehnung starke Zustimmung

36) Manchmal bringt mich mein Hund, durch das was er tut, zum Lachen.



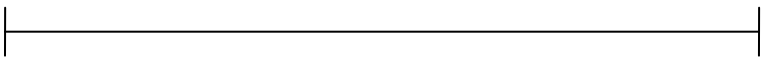
starke Ablehnung starke Zustimmung

37) Mein Hund will oft Aufmerksamkeit von mir.



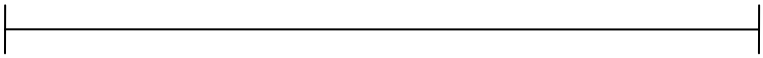
starke Ablehnung starke Zustimmung

38) Mein Hund ist ein Schlawiner, hat nur Unsinn im Kopf.



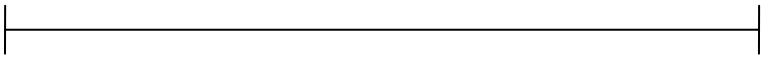
starke Ablehnung starke Zustimmung

39) Ich kümmere mich gerne um meinen Hund, die täglichen Routinen machen mir nichts aus.



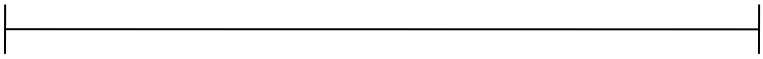
starke Ablehnung starke Zustimmung

40) Ich kümmere mich nicht gerne um meinen Hund.



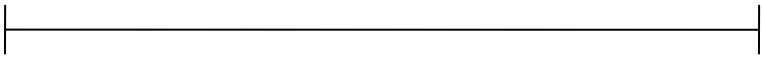
starke Ablehnung starke Zustimmung

41) Manchmal kümmere ich mich um meinen Hund, wenn ich eigentlich was anderes wichtiges zu tun hätte.



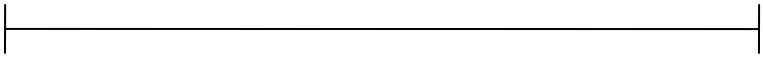
starke Ablehnung starke Zustimmung

42) Ich fühle mich für meinen Hund verantwortlich und das ist gut so.



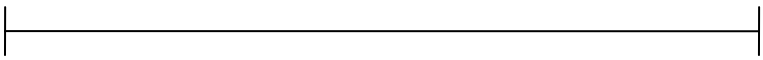
starke Ablehnung starke Zustimmung

43) Ich wäre sehr traurig, wenn ich meinen Hund verlieren würde, der Hund krank wäre oder sich verletzen würde.



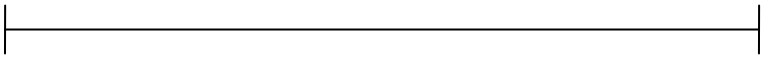
starke Ablehnung starke Zustimmung

44) Mein Hund bedeutet mir sehr viel.



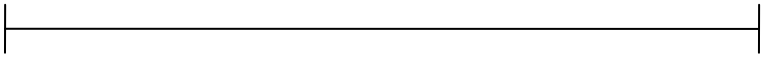
starke Ablehnung starke Zustimmung

45) Ich mag es, mit meinem Hund einfach nur herum zu hängen und zu entspannen.



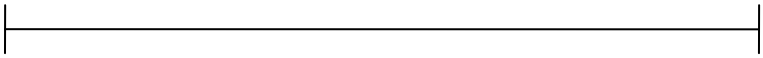
starke Ablehnung starke Zustimmung

46) Alleine durch das Zusammensein mit meinem Hund fühle ich mich gut.



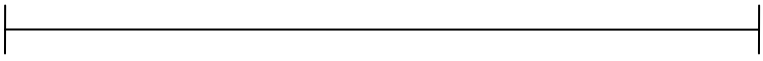
starke Ablehnung starke Zustimmung

47) Mein Hund weiß, wenn ich wirklich traurig, beunruhigt oder verärgert bin.



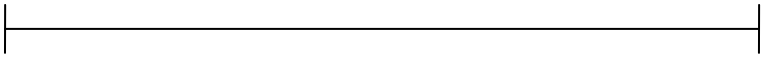
starke Ablehnung starke Zustimmung

48) Es tut mir gut, mit meinem Hund zu reden, wenn ich traurig, beunruhigt oder verärgert bin.



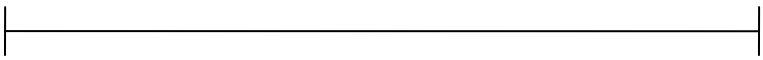
starke Ablehnung starke Zustimmung

49) Mein Hund scheint nicht zu bemerken, wie ich mich fühle.



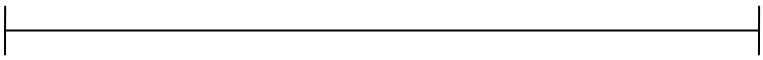
starke Ablehnung starke Zustimmung

50) Mein Hund fehlt mir, wenn wir nicht zusammen sein können.



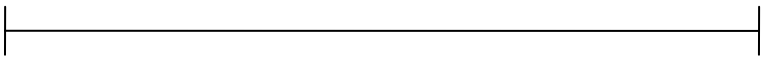
starke Ablehnung starke Zustimmung

51) Mein Hund ist ein guter Gefährte oder Freund.



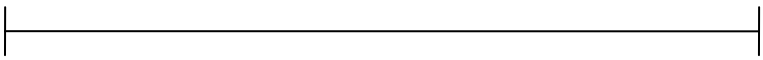
starke Ablehnung starke Zustimmung

52) Ich schmuse gerne mit meinem Hund.



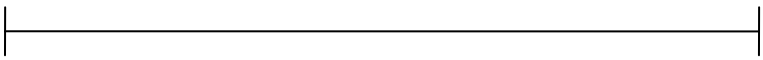
starke Ablehnung starke Zustimmung

53) Ich lege Wert darauf, Zeit mit meinem Hund zu verbringen.



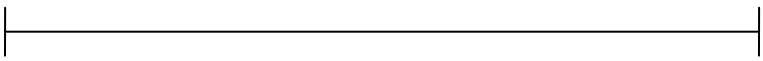
starke Ablehnung starke Zustimmung

54) Mein Hund hilft mir, mit mir selbst im Gleichgewicht zu sein.



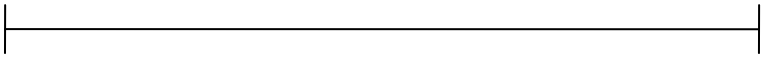
starke Ablehnung starke Zustimmung

55) Ich verbringe ziemlich viel Zeit mit meinem Hund.



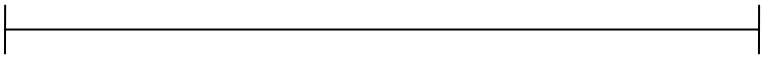
starke Ablehnung starke Zustimmung

56) Ich wollte immer einen Hund.



starke Ablehnung starke Zustimmung

57) Mein Hund liebt mich bedingungslos.

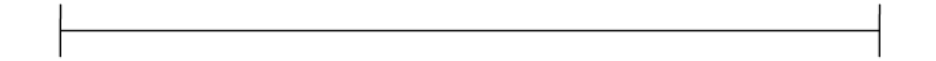


starke Ablehnung starke Zustimmung

8.3. Appendix C

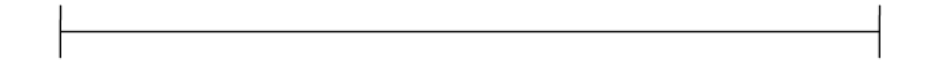
Fragebogen zur Bewältigung des Parcours - Team___

1) Wie sehr gestresst fühlen Sie sich nach der Bewältigung des Parcours?



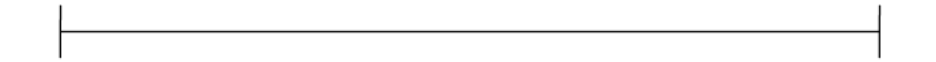
noch nie *sehr oft*

2) Wie sehr gestresst, denken Sie, ist Ihr Hund nach der Bewältigung des Parcours?



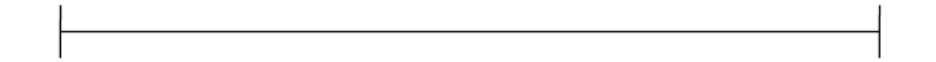
noch nie *sehr oft*

3) Wie wohl haben Sie sich während der Bewältigung des Parcours gefühlt?



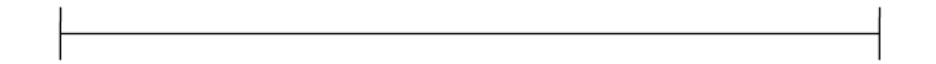
noch nie *sehr oft*

4) Wie wohl hat sich, Ihrer Meinung nach, Ihr Hund während der Bewältigung des Parcours gefühlt?



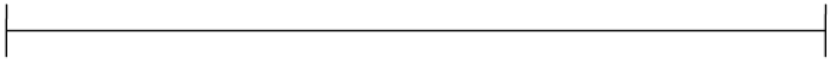
noch nie *sehr oft*

5) Wie gut, denken Sie, haben Sie den Parcours als Mensch-Hund-Team gemeistert?



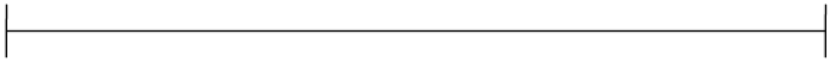
noch nie *sehr oft*

6) Wie oft haben Sie gemeinsam mit Ihrem Hund einen ähnlichen Parcours bestritten?



noch nie *sehr oft*

7) Falls Sie bereits gemeinsam mit Ihrem Hund ähnliche Parcours bestritten haben, wie gut, denken Sie, hatten Sie diese Parcours als Mensch-Hund-Team gemeistert?



noch nie *sehr oft*

8.4. Appendix D

Fragebogen zu den Speichelproben - Team ___

1) Wie wohl haben Sie sich im Laufe dieser Studie dabei gefühlt, Ihrem Hund Speichelproben zu entnehmen?

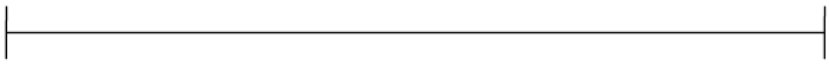
2) Wie wohl hat sich, Ihrer Meinung nach, Ihr Hund im Laufe dieser Studie bei den Speichelprobenentnahmen gefühlt?

3) Wie sehr gestresst haben Sie sich gefühlt, nachdem Sie Ihrem Hund Speichelproben entnommen haben?

4) Wie sehr gestresst hat sich, Ihrer Meinung nach, Ihr Hund gefühlt, nachdem Sie ihm Speichelproben entnommen haben?

5) Wie oft wurde Ihr Hund schon auf ähnliche Weise, wie bei der Speichelprobenentnahme, untersucht oder behandelt (z.B. Zähne putzen, schmerzfreie Behandlungen im Mundraum)?

5.1) Falls Ihr Hund schon auf ähnliche Weise, wie bei der Speichelprobenentnahme, behandelt oder untersucht worden ist (z.B. Zähne putzen, schmerzfreie Behandlungen im Mundraum), wie wohl hat sich Ihr Hund Ihrer Meinung nach dabei gefühlt?



noch nie *sehr oft*

5.2) Falls Ihr Hund schon auf ähnliche Weise, wie bei der Speichelprobenentnahme, behandelt oder untersucht worden ist (z.B. Zähneputzen, schmerzfreie Behandlungen im Mundraum), hat Ihr Hund genauso reagiert wie bei den Speichelprobenentnahmen?

- o Ja
- o Nein

Wenn nein, wie hat Ihr Hund reagiert:

Einverständniserklärung

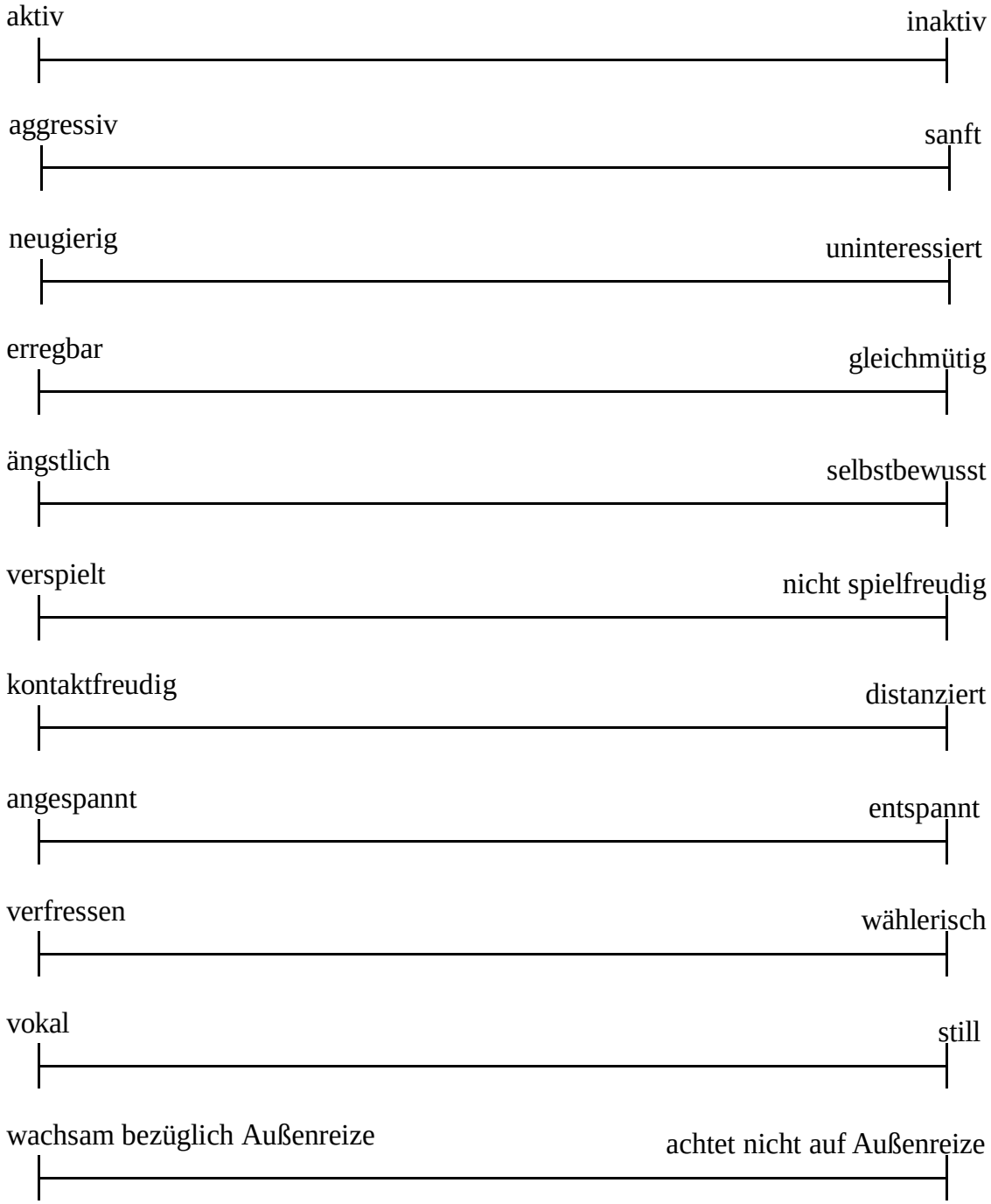
Ich erkläre mich hiermit einverstanden, dass die von mir und meinem Hund im Zuge der Studie „Mensch-Hund-Beziehung“ (der Universität Wien, der Konrad-Lorenz-Forschungsstelle und des IEMT Wien) aufgezeichneten Videomaterialien für Präsentationen, Publikationen und Fernsehberichte verwendet werden.
Ich bin damit einverstanden, dass die von mir und meinem Hund im Zuge der Studie „Mensch-Hund-Beziehung“ aufgezeichneten Videomaterialien von Andrea Eder (Lucky Dogs), für Vorträge und für die Projektarbeit ihrer internationalen Hundetrainerprüfung verwendet werden.

Datum

8.5. Appendix E

Beurteilung durch Scorer: _____ Team: _____

Der Hund ist (zutreffende Stelle der Skala ankreuzen):



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Last but not least I want to thank my friends for the beautiful student time: Cihangül, Dani, Selda, Tanja and Katrin.

Curriculum vitae

Personal Information:

Name:	Ifa Aliabadi
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School education:

1991-1995	Elementry school Thaya
1995-2001	Secondary school Waidhofen an der Thaya
2001-2004	Secondary school Vereinsgasse, Vienna
2005-2010	Biology/ Zoology studies at the University of Vienna

Congresses:

1.-4. July	IAHAIO in Stockholm, oral presentation
25.-28. July	Canine Science Forum in Vienna, poster presentation

Additional Qualifications:

Languages:	English in speech and writing
	Persian, Latin und Russian – basic knowledges
EDV:	MS-Office, SPSS, The Observer